



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/825,611	04/03/2001	Sujit Sharan	95-0716.02	3508

7590

09/10/2003

Charles Brantley  
Micron Technology, Inc.  
8000 S. Federal Way  
Mail Stop 525  
Boise, ID 83716

EXAMINER

KILDAY, LISA A

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/825,611

Applicant(s)

SHARAN ET AL

Examiner

Lisa A Kilday

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 03 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213

## Disposition of Claims

- 4) ☐ Claim(s) 35-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) 35-66 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 35-36, drawn to method of providing a CVD environment, classified in class 438, subclass 680.
- II. Claims 37-39, drawn to an atmosphere for a CVD process, classified in class 118, subclass 719.
- III. Claims 40-1, drawn to a plasma, classified in class 427, subclass 569.
- IV. Claims 42-66, drawn to a method of supporting a reaction between a precursor gas and a reactive gas, classified in class 430, subclass 5.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because if the CVD is a thermal CVD the subcombination is mutually exclusive. The subcombination has separate utility such as CVD and an atmosphere for thermal CVD cannot be used together.

Inventions I and III are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP §

806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the plasma subcombination can be used together with thermal CVD. The subcombination has separate utility such as HDP CVD.

Inventions I and IV are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because they are unrelated mutually exclusive subcombinations. The subcombination has separate utility such as it can support reactions in the secondary ion effect.

**Species Restriction for Method Embodiments:**

Applicant must choose from Group I-IV. If applicant elects group I or group IV, applicant must elect from the following species. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

This application contains claims directed to the following patentably distinct species of the claimed invention:

Species are defined by elements A-K below:

**Applicant must choose an element from A-K:**

A, Type of deposition:

1. CVD (¶ 3)
2. PECVD (¶4)
3. HDP CVD (¶8)

B, Use of reaction promoter gas (¶44)

1. Use of reaction promoter gas
2. Without use of reaction promoter gas (skip to E1-2)

**First Grouping:**

*If applicant chooses B1, choose from the element C-D:*

C, Type of reaction promoter gas (¶12)

1. Adding a material that reduces the partial pressure contribution of at least one other gas reacting in said process
2. Material is an inert gas, a noble gas
3. Material is inert with respect to the current reaction, although it may be chemically active in other reactions
4. Material chemically reacts with the other gases

*If applicant chooses C2, choose from element D:*

D, Type of noble gas (¶37)

1. Argon
2. Helium
3. Neon
4. Krypton
5. Xenon

6. Radon

7. Combinations of #D1-6

**Second Grouping:**

E, Type of layer depositing (§2, 39)

1. Metal and conductive films

2. Insulating films (§38)

*If applicant chooses E1, choose from elements F-G:*

E, Type of metal/conductive film deposited (§39):

1. Aluminum

2. Copper

3. Aluminum-Copper alloys

4. Tin

5. Titanium

6. Lead

7. Titanium Tungsten alloys

8. Tungsten

9. Tungsten alloys

G, Metal source precursor (§39):

1. Organic

2. Inorganic

H, Method of distributing deposition source gas (§39):

1. Gas phase

2. Liquid source converted to the gas phase through a bubbler system

I, Parameters of the deposition (§ 9, 40):

1. IC HDP reactor
2. No IC HDP reactor

J, Other uses and alternative results for reaction-promoter gases (§§ 13, 42-43):

1. Reactive sputtering/Self-sustained sputtering
2. Plasma etching
3. No other uses or alternative results

Optional specie:

Paragraph 43 on pg. 15 describes several embodiments of the current invention. The embodiments include: promoting, encouraging, fostering, assisting, aiding, advancing, cultivating, supporting, or otherwise participating in a chemical reaction for any plasma process. It is unclear whether all embodiments share the effects listed above. Or whether each embodiment contains a distinct effect on a chemical reaction making each effect on a chemical reaction mutually exclusive. Therefore if the terms promoting, encouraging, fostering, assisting, aiding, advancing, cultivating, supporting, or otherwise participating can be used interchangeably, then the applicant should not elect a species. If the chemical reactions are mutually exclusive and determine an effect on a chemical reaction, the applicant should elect an embodiment in K1-K9. The applicant shall supply reasoning to support an election of species K or to support making the embodiments of K1-K9 generic.

K, Effect on chemical reaction (§43):

1. Promoting
2. Encouraging
3. Fostering
4. Assisting
5. Aiding
6. Advancing
7. Cultivating
8. Supporting
9. Participating

If applicant elects a method, applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claim is generic. An example of an embodiment is A1B1C2D1E1F1G1H1J1K1. This would be a CVD deposition using a reaction promoter gas where the reaction promoter gas is a material that is an inert, noble gas, such as Argon, to form a metal and conductive film, such as Aluminum using an organic precursor that is distributed during the gas phase where the reaction takes place in an IC HDP reactor and the reaction-promoter gas also creates a self-sustain sputtering and promotes the chemical reaction.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim



is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

A telephone call was made to Charles Brantley on 8/26/03 to request an oral election to the above restriction requirement, but did not result in an election being made.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement is traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

**Conclusion**

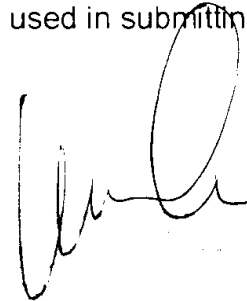
Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0957. See MPEP 203.08.

Any inquiry concerning this communication from the examiner should be directed to Lisa Kilday whose telephone number is (703) 306-5728. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo, can be reached on (703) 308-1233. The fax number for the group is (703) 305-3432. MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.

Lisa Kilday

LAK

9/4/03

A handwritten signature in black ink, appearing to read 'Lisa Kilday', is written over the signature line.